

# A New Species of *Bulnesia* (Zygophyllaceae) from the Xerothermic Southern Puna of Bolivia

Gonzalo Navarro

Departamento de Biología Vegetal II (Botánica), Facultad de Farmacia, Universidad Complutense, 28040-Madrid, Spain

**ABSTRACT.** *Bulnesia rivas-martinezii* from southern inter-Andean Bolivia is described. Illustrations and ecological data for the new species are provided, as is a key to the three most closely related species of *Bulnesia* subg. *Bulnesia*.

The genus *Bulnesia* was recently revised by Palacios & Hunziker (1984), who recognized eight species. During a geobotanical survey of southern Andean Bolivia, a shrubby microphyllous *Bulnesia* was collected in late 1992 and is described here; the plant represents a geographically isolated taxon related to both *Bulnesia schickendantzii* Hieronymus and *B. foliosa* Grisebach. These relationships provide additional evidence about the origins and phytogeographical connections between the floras of Gran Chaco, the Monte, and the xerothermic Puna (Prepuna).

The new species is named for Salvador Rivas-Martínez, leader of Spanish botanists and a pioneer of geobotanical research in the Andes.

***Bulnesia rivas-martinezii*** G. Navarro, sp. nov.

**TYPE:** Bolivia. Chuquisaca: Provincia Sud Cinti, entre Villa Abecia y Camargo, a 1 km de Saladillo, 2,420 m, en bosque bajo y abierto de *Acacia feddeana* Harms, 28 dic. 1992, G. Navarro 1913 (holotype, LPB; isotypes, BOLV, MAF, MO). Figures 1, 2.

Frutex lignosis 0.5–1.5 m altis. Folia (2.5–)5–8(–10) mm longis et 4–8 mm latis; foliolii (2–)4–6(–8), adpressis pubescentibus oblongo-ovati et mucronulati, (1.5–)3–6(–8) mm longis et (1.5–)2–3(–3.5) mm latis; flores solitarii, axillares, petala alba vel albescentia; squama staminalis apicibus laciniatoribus, externa duplicata et marginibus connatis, interna simplex; ovarium oblongum-fusiforme 5-angulatis dense adpressis-pubescentibus, pilis albis-sericeis; fructus oblongus-fusiformis vel oblongus-ellipticus, 5-alatis, 17–22(–25) mm longis et 5–7(–8) mm latis, adpressis-pubescentibus, pilis albis-sericeis.

Shrub, 0.5–1.5 m tall, branches (Fig. 1A) terete and covered with longitudinally fissured bark. In-

ternodes (Fig. 1B) 3–10 mm long, 0.6–5 mm wide. Leaves (Fig. 1C, 2A) (2.5–)5–8(–10) mm long, 4–8 mm wide; leaflets (2–)4–6(–8), alternate, (1.5–)3–6(–8) mm long, (1.5–)2–3(–3.5) mm wide, oblong to ovate, basally asymmetric and scarcely mucronate, appressed-hairy on both surfaces; petiole 0.5–1.5 mm long with appressed pubescence; rachis 2–7 mm long, shortly mucronate and appressed-hairy. Stipules (Fig. 1B) caducous, 1–1.5 mm long, ovate-acute and reddish. Flowers (Fig. 1D, E) axillar and solitary; pedicels 5–8 mm long, villous-tomentose. Sepals 5–7 mm long, 2.5–4 mm wide, unequal (2/2/1) and puberulent with scarious margins. Petals 7–9 mm long, 2.5–3.5 mm wide, white or whitish, obovate-spathulate and clawed, shortly mucronate. Stamens 7–11 mm long; filaments 5–7 mm long, united at the base or free; anthers ca. 2–2.2 mm long, yellowish to violaceous; staminal scales (Fig. 2B, C, D), 3–4 mm long, 2 mm wide, inner simple, outer with two blades marginally connate into a short tube and with several basal violaceous filaments equaling or longer than the scale; both deeply lacinate apically, with numerous lacinia 1.5–2 mm long, 0.1–0.2 mm wide. Ovary (Fig. 2E) ca. 3 mm long, 1.5–1.7 mm wide, 5-angled, oblong-fusiform, densely appressed pubescent with hairs (Fig. 2F, G) white-sericeous, 0.1–0.4 mm long; 5 locules with 4–6(–8) pendulous-biseriate ovules. Style ca. 2.5 mm long, subulate, glabrous. Carpophore ca. 1 mm long. Fruit (Fig. 1B, F, g) 17–22(–25) mm long, 5–7(–8) mm wide, oblong-elliptic, 5-winged and  $\pm$  appressed-hairy with whitish hairs 0.1–0.4 mm long. Seed (Fig. 1h) oblong, 4–5(–6) mm long, 1.5–2(–2.3) mm wide. Pollen grain (Fig. 2H, I, J) radially symmetrical, isopolar, prolate (polar axis (P) = 12.83  $\mu$ m (11.75–14.1), standard deviation (S) = 0.62; equatorial diameter (E) = 10.98  $\mu$ m (9.1–12.24), S = 0.71; P/E = 1.17), elliptical in meridional view (Fig. 2H) and 3-lobate, subcircular in polar view (Fig. 2I); 3-zonocolporate (Fig. 2H, I), ectoaperture type colpus, endoaperture irregular pore; exine tectate and reticulate; tectum complete on the colpus margins; infratectum columellate.



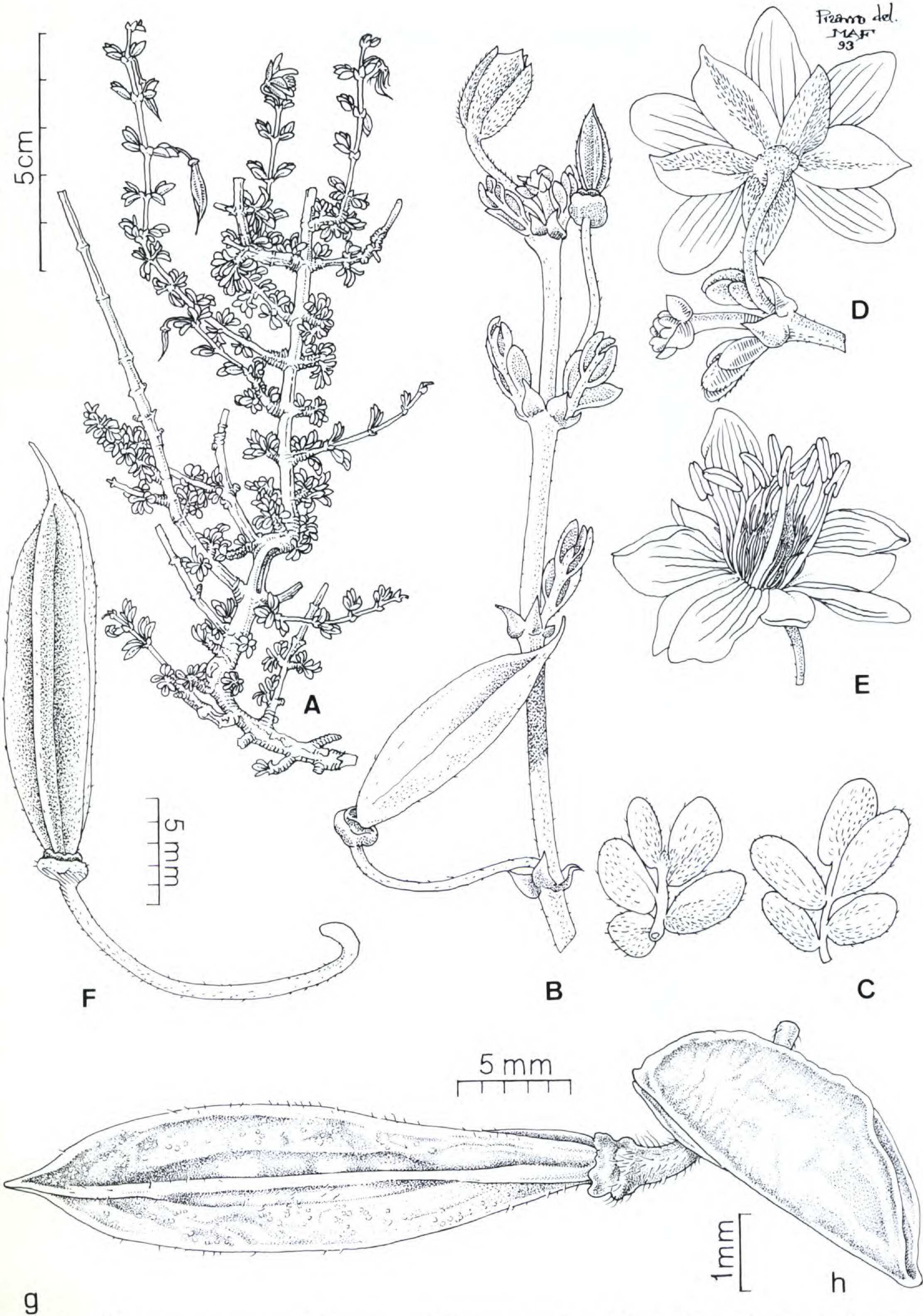


Figure 1. *Bulnesia rivas-martinezii* G. Navarro. — A. Flowering branch. — B. Detail of a branch, showing internodes, stipules, bud, and immature fruits. — C. Larger leaves with five leaflets. — D. Sepals and pedicel. — E. Flower. — F. Submature fruit. — g. Mature fruit. — h. Seed. Drawings A–F, from G. Navarro 1913. Drawings g and h, from G. Torrico & C. Peca 321.



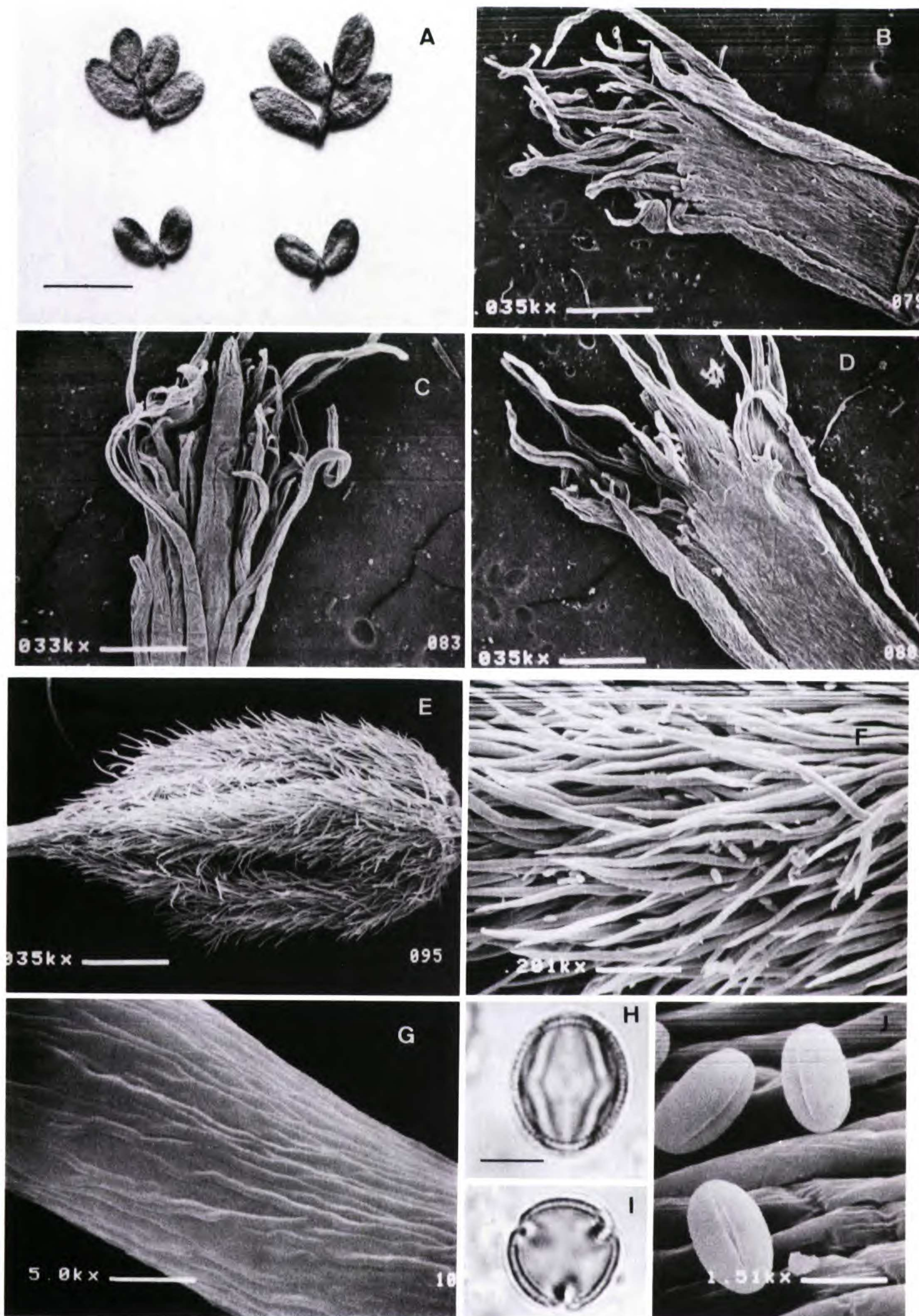


Figure 2. *Bulnesia rivas-martinezii* G. Navarro. —A. Leaves with two and four leaflets. —B, C, D. Staminal scales showing the lacinias. —E. Ovary. —F. Detail of ovary pubescence. —G. Detail of an ovary hair. —H. Optical meridional view of pollen grain. —I. Optical polar view of pollen grain. —J. Pollen in the style. (A, photomicrograph;



H and I, LM-photomicrographs; B, C, D, E, F, G, and J, SEM-photomicrographs; A, scale bar = 5 mm; B, D, and E, scale bar = 0.57 mm; C, scale bar = 0.60 mm; F, scale bar = 0.1 mm; G, scale bar = 4  $\mu\text{m}$ ; H and I, scale bar = 0.01 mm; J, scale bar = 13.24  $\mu\text{m}$ .)



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